**ПРИЛОЖЕНИЕ № 4**

**Перевод** **газетно-публицистического текста с английского языка на русский**

**The Brain**

What is the brain? Obvious answers might be “what you think with” or “where the mind happens”. Physically, the brain is 1300 grams almost entirely made up of fat and water. Incredibly, that uninspiring mix forms the most complex system in the known universe. The cerebral cortex is made up of 15 billion neurons, each of which connects to approximately 50,000 others. That’s some 750,000 billion connections. These connections can be fired up to 200 times a second and the more they are fired, the stronger they become. So the brain develops5 as6 it is used so as to be7 more efficient at whatever it is used for.

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The cortex has an area of around 40cm2. Since8 that is bigger than the inside of the skull, the cortex has to fold up10 creating the characteristic surface of the human brain. The cortex does all the higher thinking, while the brain-stem takes charge of basic body functions: breathing, eating, sleeping and procreating. This means that the boring but necessary functions (i.e. breathing and sleeping) happen without us consciously having to worry about them.

The really cool thing about the cortex is that it is divided into two relatively independent asymmetric hemispheres that think in different ways. The left hemisphere focuses on our specific needs, while the right hemisphere is more interested on what is happening outside ourselves. The left hemisphere focuses attention, the right hemisphere is holistic – it sees the bigger picture, putting us in touch with the world. The left hemisphere predicts and expects: it lives in a world of models, categories and patterns. By contrast, the right hemisphere is more concerned about15 what is unique and individual about people, things and ideas. As a result, the right hemisphere is good at recognizing individuals’ faces, the left hemisphere tends to categorize people. The right hemisphere is on the lookout for16 what is new; it is therefore more flexible in its thinking. It is the Devil’s advocate actively seeking out discrepancies to the left hemisphere’s rules. Humour tends to be based on anomalies, so the right hemisphere tends to process what is funny. The left hemisphere reads emotions in the lower half of the face (i.e. around the mouth), the right hemisphere reads emotions around the eyes. None of this means that either hemisphere is better. Our intelligence is based on the combination of the two systems – grasping the insights of both logic and intuition.

The division of the cortex in two is probably why we tend to see two sides to any argument, why we contrast self and community, abstraction and the concrete, the general and the particular, the part and the whole.

**Where Memories Reside**

It’s hard to think of something as intangible as memories but the physical facts of memory formation are gradually being revealed. A team from the University of California has actually observed memories being laid down in the brain of sea slugs, in the form of new proteins appearing at the synaptic connections between nerve cells.

Short term memories are created in the protein of our hippocampi. These changes are then mirrored by similar changes in the cortex for memorable events, the formation of long-term memories. Traumatic memories also affect the neurons in the amygdala. Researchers at the Hospital for Sick Children in Toronto were even able to erase a frightening memory of a noise in the brains of mice by killing amygdala neurons whose synapses had recently been strengthened. This was the first time a specific memory had been traced to the nerve cell encoding it.

**The Man with No Memories**

We know that short-term memories happen in the hippocampi and the amygdala thanks to one man’s tragedy. When a brain operation to cure his epilepsy went pear-shaped in 1953, Henry Molaison (1926-2008) was left without the ability to form memories. The botched surgery had eliminated the frontal half of his hippocampi and most of his amygdala. Henry lived the next half century in the present.

Molaison’s tragedy was the most important case in the history of neuroscience. Henry forgot all of his post-operation experiences within 30 seconds. However, he retained most of his memories from before his surgery. Moreover, he had an above-average intelligence, language skills and a good-humoured personality.

Fascinatingly, although Henry could not form new information, he could learn and retain new motor skills – such as playing tennis, riding a bicycle or playing the piano. Henry Molaison’s life was a tragedy and a liberation. Living in the present he was liberated from the fictional construct of linear time. But he was also condemned to learn of his parents’ deaths anew every time they came up in conversation.

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